

Work Order ID 79041

\*79041\*

Page 1

January-18-12 3:54:16 PM

ASAP

Item ID: D2500-3-100

Accept

\*N900040100\*

Setup Start \*NS1\*

Revision ID:

Item Name: Ext'n - T Beam Web 4"

Stop \*NS2\*

Start Date: 18/01/2012 Start Qty: 60.00

~~\*60\*~~

Cust Item ID:

Required Date: 25/01/2012 Req'd Qty: 60.00

\*60\*

Customer:

Reference:

Approvals: Process Plan: M.L.J Date: 12/01/18

Tooling:

Date:

Run Start \*NR1\*

QC: Date:

SPC (Y/N):

Date:

Stop \*NR2\*

| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| Draw Nbr                       | Revision Nbr             |                      |         |        |              |               |               |                  |                |
| D2500                          | Rev H                    |                      |         |        |              |               |               |                  |                |

100 PURCHASING 0.00

\*100\*

Purchasing

Purchasing

PURCHASING

Memo

Issue P/O:

15930

- a) Extrude as per Dwg D2500
- b) Material: 6061-T6 (QQ-A-200/8)
- c) Minimum yield tensile strength = 35 ksi
- d) Minimum ultimate tensile strength = 38 ksi
- e) Minimum elongation = 8%
- f) Order at 100" long
- g) Caradon Indalex Tool # MS-18867
- h) To be packed per DSK 066
- i) Pull test to ASTM standard B221 required.
- j) Material certification is required

0.00

12-01-19

110 Receive & Inspect for Damage & Mat'l Certs 0.00

\*110\*

Packaging

Packaging

Memo

Ensure material certification is attached

0.00

1/4/16 70

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Work Order ID 79041

\*79041\*

Page 2

January-18-12 3:54:16 PM

Item ID: D2500-3-100

Accept

\*N900040100\*

Setup Start

\*NS1\*

Revision ID:

Stop

\*NS2\*

Item Name: Ext'n - 'I' Beam Web 4"

Start Date: 18/01/2012 Start Qty: 60.00

\*60\*

Cust Item ID:

Required Date: 25/01/2012 Req'd Qty: 60.00

\*60\*

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

\*NR1\*

QC:

Date:

SPC (Y/N):

Date:

Stop

\*NR2\*

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

120

QC6- Inspect dimensions to drawing

0.00

\*120\*

QC

Quality Control

Memo

Check Pull test per Dwg D2500 for compliance page attached. Check hardness with Webster tester

0.00

S, 12/02/11

(68)

P/B →

130

Identify as per dwg & Stock Location: 4/6

0.00

\*130\*

Packaging

Packaging

Memo

Pull Qty = 20 for QC

inspect

5-12/02/11

0.00

MB2 / ID

12-2-13

140

QC21- Final Inspection - Work Order Release

0.00

\*140\*

QC

Quality Control

Memo

0.00

H

M.C.J 12/02/14

M.C.J 12/02/14  
(69)

| W/O: 79041 |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE       | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|            |      |                    |    |      |     |                                     |                          |
|            |      |                    |    |      |     |                                     |                          |

Part No: DZ500-3-100 PAR #: \_\_\_\_\_ Fault Category: Red Tagging NCR: Yes No DQA Inte Date: 12/2/12  
 Resolution: Scrap Disposition: Scrap QA: N/C Closed: ck Date: 12/2/17

| NCR: 12-12-15 |      | WORK ORDER NON-CONFORMANCE (NCR) 12.20                                   |                             |                                 |                |                           |                         |                          |
|---------------|------|--|-----------------------------|---------------------------------|----------------|---------------------------|-------------------------|--------------------------|
| DATE          | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng   | Approval<br>QC Inspector |
|               |      |  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                         |                          |
| 12/02/11      | #30  | Qty x1 web found in<br>Bundle with major<br>Damage in ref.<br>D.C. Handy | S<br>12/02/11<br>ASZ042     | -SCRAP + Destroy<br>Qty x1      | WN<br>12/02/11 | S<br>12/02/11             | S<br>12/02/11<br>ASZ042 | S<br>12/02/11            |
|               |      |  |                             |                                 |                |                           |                         |                          |
|               |      |  |                             |                                 |                |                           |                         |                          |

NOTE: Date & initial all entries

# Picklist Print

January-18-12 3:54:21 PM

Page 1

Work Order ID: 79041

\*79041\*

Parent Item: D2500-3-100

\*D2500-3-100\*

Parent Item Name: Ext'n - 'I' Beam Web 4"

Start Date: 18/01/2012

Required Date: 25/01/2012

Start Qty: 60.00

Required Qty: 60.00

## Comments:

IPP: E02.09.10Added DSK 066 KJ

IPP F 07.07.06 rev G dwg

EC

IPP Rev:G as per

dwg revH DD 10.02.23 verified byEC

| Component Item ID/<br>Item Name | Replacement<br>Item ID | Mfg/<br>Purch | Bin<br>Item | Primary<br>Location | Last<br>Location | Route<br>Seq ID | Unit of<br>Measure | Qty on<br>Hand | Qty per Kit | Total<br>Qty | Qty<br>Issued | Date<br>Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| D2500-3-100P                    |                        | Purchased     | No          |                     |                  | 110             | Each               | 0.0000         | 1           | 60           |               |                |        |

\*D2500-3-100P\*

Ext'n - 'I' Beam Web 4"

\*\*

C12/2/6 (30)

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# SPECIFICATION CONTROL DRAWING

## D2500-1-XXX EXTRUSION & D2500-3-XXX EXTRUSION

### NOTES:

1) MATERIAL: 6061-T6 ALUMINUM PER QQ-A-200/8 OR AMS-QQ-A-200/8 OR ASTM B221

MINIMUM TENSILE YIELD STRENGTH = 35 KSI  
MINIMUM ULTIMATE TENSILE STRENGTH = 38 KSI  
MINIMUM ELONGATION = 8%

A SAMPLE FROM EACH BATCH WILL BE PULL TESTED TO ASTM STANDARD B221 BY AN APPROVED TESTING FACILITY TO ENSURE THAT THE BATCH MEETS THE ABOVE MINIMUM MECHANICAL PROPERTIES

2) FINISH: N/A

3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED

4) UNITS: INCHES UNLESS OTHERWISE NOTED

5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX

6) IDENTIFICATION: IDENTIFY WITH DART B/N USING FINE POINT PERMANENT INK MARKER

7) WEIGHT: D2500-1 = 0.143 lb/in, D2500-3 = 0.066 lb/in

8) FOR D2500-1 PART NUMBER IS D2500-1-XXX WHERE XXX IS CUT LENGTH (EX. D2500-1-190 IS 190" LONG). D2500-1 EXTRUSION MANUFACTURED FROM:

- A) BON L DIE # 897105 -> PREFERRED
- B) CARADON MIDEAST DIE # PAH-28030
- C) CARADON MTL DIE # MH-18868

9) FOR D2500-3, PART NUMBER IS D2500-3-XXX WHERE XXX IS CUT LENGTH IN INCHES (EX. D2500-3-100 IS 100" LONG). D2500-3 EXTRUSION MANUFACTURED FROM:

- A) CARADON INDALEX DIE # MS-18867

SHOWN BY  
REF ID  
EXCISE NO  
UNCONTROLLED  
SUBMITTAL  
WORKING  
VARIATION  
NO. 79091 M.L.O  
12/01/18

RELEASED  
2010-02-03  
MP

|            |  |   |          |
|------------|--|---|----------|
| H          | REDRAW & REFORMAT DWG; CORRECT BON L DIE #<br>TYPO (ZN B8-1), ADD AMS & ASTM MAT'L OPTION (ZN<br>D8-1), TOLERANCES NOW PER CARADON DWG (SHT 2) | CP  | 09.07.16 |
| G          | ADD DIE NUMBERS & 'DIMS IN INCHES' NOTES   | PH  | 07.04.17 |
| F          | CHANGE MAT. TO 6061-T6   | DS  | 97.09.29 |
| E          | CHANGE MATERIAL TEMPER   | DS  | 96.10.24 |
| D          | ADD MATERIAL PROPERTIES  | DS  | 96.10.07 |
| C          | ADD D2500-3 WEB  | BW  | 96.04.26 |
| B          | CHANGE INTERNAL WEB  | DS  | 96.03.24 |
| A          | NEW ISSUE  | DS  | 96.03.19 |
| REV.       | DESCRIPTION  | BY  | DATE     |
| DESIGN     | 4  | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA<br>DRAWING NO. REV. H<br>D2500 SHEET 1 OF 2<br>TITLE SCALE<br>EXTRUSION NTS<br>COPYRIGHT © 1996 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS<br>NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT<br>WRITTEN PERMISSION FROM DART AEROSPACE LTD. |          |
| DRAWN      | 4  |   |          |
| CHECKED    | 4  |   |          |
| MFG. APPR. | 4  |   |          |
| APPROVED   | 4  |   |          |
| DE APPR.   | 4  |   |          |
| DATE       | 09.07.16   |   |          |

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

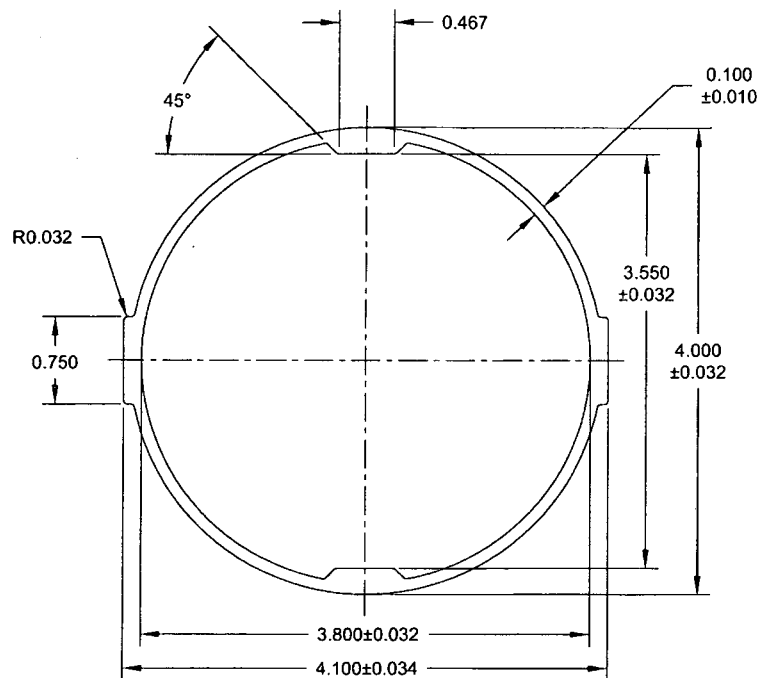
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

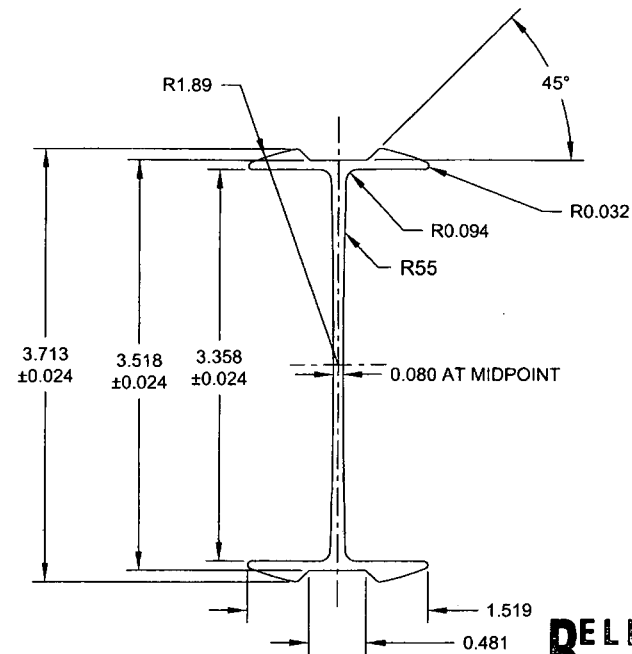
NOTE: Date & initial all entries



79041



**D2500-1**



**D2500-3**

**RELEASED**  
2010-02-02  
MJP

|            |                    |  |              |
|------------|--------------------|--|--------------|
| DESIGN     | <i>[Signature]</i> | <b>DART AEROSPACE LTD</b>  |              |
| DRAWN      | <i>[Signature]</i> | HAWKESBURY, ONTARIO, CANADA  |              |
| CHECKED    | <i>[Signature]</i> | DRAWING NO.  | REV. H       |
| MFG. APPR. | <i>[Signature]</i> | D2500  | SHEET 2 OF 2 |
| APPROVED   | <i>[Signature]</i> | TITLE  | SCALE        |
| DE APPR.   | <i>[Signature]</i> | EXTRUSION  | NTS          |
| DATE       | 09.07.16           | <small>COPYRIGHT © 1996 BY DART AEROSPACE LTD<br/>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small> |              |

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO15930

Purchase Order Date 1/19/12

PO Print Date 2/06/12

Page Number 1 of 1

Order From :

VC-SAP001

SAPA CANADA INC  
LOCKBOX B9427  
PO BOX 9100  
POSTAL STATION F  
TORONTO, ONTARIO M4Y 3A5  
CANADA

Contact Name

Vendor Phone 800 563 5120

Vendor Fax 800 563 8310

Vendor Account Nbr

Buyer

Brigitte Golden

Requisition Nbr

Tax Resale Nbr 10127-2607

Terms

Net 30

Currency

CAD

FOB

Destination-Collect

Ship To :

DART AEROSPACE LTD

1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

*RECEIVED*

| Line Nbr | Reference<br>Revision ID<br>Vendor Part Number | Description/<br>Mfg ID | Req Date/<br>Taxable | Req Qty/<br>Unit of Measure | Ship Method | Unit Price | Extended<br>Price |
|----------|--|------------------------|----------------------|-----------------------------|-------------|------------|-------------------|
| 1        | D2500-3-100P                                   | Ext'n -1' Beam Web 4"  | 2/09/12<br>Yes       | 60.00<br>Each               | Yours ppd   | \$15.7500  | \$945.00          |

Special Inst: EXTRUDE AS PER DWG D2500 REV. H  
B79041  
MATERIAL: 6061-T6 ( QQ-A-200/8 )  
MINIMUM YIELD TENSILE STRENGTH  
= 35 KSI  
MINIMUM ULTIMATE TENSILE  
STRENGTH = 38 KSI  
MINIMUM ELONGATION = 8%  
100" LONG  
CARADON INDALEX ( SAPA ) TOOL #  
MS-18867  
TO BE PACKED PER DSK 066  
PULL TEST TO ASTM STANDARD B221  
REQUIRED

PO Total:

\$945.00

Change Nbr: 4

Change Date: 2/06/12

No substitution or deviation without  
consent.  
Certificate of Conformity or Material  
Certification required when applicable

**PROFILÉS D'ALUMINIUM - ANODISATION - FABRICATION - PEINTURE**  
**ALUMINUM EXTRUSIONS - ANODIZING - FABRICATION - PAINTING**

Sapa Canada, Inc.  
 Adresse Postale 325, rue Avro  
 Pointe-Claire, Québec H9R 5W3  
 Téléphone: (514) 697-5120  
 Télécopieur: (514) 694-8310

**sapa:**

VENDU À / SOLD TO

EXPÉDIÉ / SHIP TO

INDICATIONS SPÉCIALES  
 SPECIAL INSTRUCTIONS

P/S#: 805357

NOTRE NUMÉRO DE COMM.  
 OUR ORDER NO.

2011093 1

**CERTIFIÉ**  
**ISO 9001:2008**

DART AEROSPACE LTD  
 1270 ABERDEEN STREET  
 HAWKESBURY, ONT

DART AEROSPACE LTD  
 1270 ABERDEEN STREET  
 HAWKESBURY, ONT

KGA1K7

KGA1K7

CUSTOMER P.S.T.: \*6122-5207 9822 G.S.T. REC NO: 0857314058

PROJ:

Required Date:

|                           |                                     |  |  |                                |                                       |                          |
|---------------------------|-------------------------------------|--|--|--------------------------------|---------------------------------------|--------------------------|
| N° DU CLIENT<br>CUST. NO. | R.P.S.<br>G.S.T.                    | TAXE DE VENTE PROV.<br>PROV. SALES TAX | N° DE COMM. DU CLIENT<br>CUST. ORDER NO. | DATE DE COMMANDE<br>ORDER DATE | NOTRE DATE DE COMM.<br>OUR ORDER DATE | CONDITIONS<br>TERMS      |
| 201355                    | XXXXXX                              |  | 15030                                    | 12/01/19                       | 12/01/23                              |                          |
| Vendeur<br>SALESMAN       | PAYÉ<br>PPD.                        | PERC<br>COL.                           | C.A.D.<br>C.O.D.                         | F.A.B.<br>F.O.B.               | EN BALLOTS<br>BUNDLED AND TAPED       | CARTONNÉ<br>CARTONED     |
| 27                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/>                 | <input type="checkbox"/>       | <input type="checkbox"/>              | <input type="checkbox"/> |

|                                   |                           |
|-----------------------------------|---------------------------|
| DATE DE LIVRAISON<br>DATE SHIPPED | ENVOYÉ PAR<br>SHIPPED VIA |
| 12/02/03                          | QUEST 6 FEV.              |

| N°<br>ITEM<br>ITEM NO. | COMMANDE / ORDERED |                  | N° DE MATRICE<br>SAPA DIE NO. | DESCRIPTION DU CLIENT<br>CUSTOMER DESCRIPTION   | ALLIAGE ET TREMPAGE<br>ALLOY AND TEMPER | LONGUEUR<br>LENGTH | PRIX UNITAIRE<br>UNIT PRICE |
|------------------------|--------------------|------------------|-------------------------------|---|---|--------------------|-----------------------------|
|                        | POIDS<br>WEIGHT    | PIÈCES<br>PIECES |                               |   |   |                    |                             |
| 1                      | 180                | 60               |                               | F EXTRUDE ONLY<br>DUE=2012/02/09 JA31AS<br>MS 18867 D2500-3-100P 6061 T6 2540<br>D2500-3<br>BUNDLE= 1007366 |   |                    |                             |

| COMMANDE / ORDERED |                  | CETTE EXPÉDITION / THIS SHIPMENT |                 |             | MONTANT<br>AMOUNT |
|--------------------|------------------|----------------------------------|-----------------|-------------|-------------------|
| POIDS<br>WEIGHT    | PIÈCES<br>PIECES | BALLOTS<br>BDLES.                | POIDS<br>WEIGHT | PCES / PCS. |                   |
|                    |                  | 1                                | 198             | 70          | POIDS EN KGS      |

We hereby certify that the material supplied meets the chemical properties as published by the Aluminum Association, and requirements of our Quality procedures

225 rue Avro  
Pointe-Claire, QC, Canada H9R 5W3  
Téléphone (514) 697-3120  
Fac-simile (514) 694-8310



## Rapport des propriétés mécaniques Mechanical Properties Test Report

Client / Customer : **DART AEROSPACE LTD**  
Adresse / Address : **1270 ABERDEEN STREET  
HAWKESBURY ONT,  
K6A 1K7**

# commande Sapa / Sapa order # :

**2011093**

# bon de commande / Purchase order # :

**15930**

# de matrice / Die # : **MS 18867**

Description : **D2500-3**

Alliage & trempage / Alloy & temper : **6061 T6**

Customer Part #: **D2500-3-100 P**

# Contrôle / Control # : **60766-1**

# Coulée / Cast # : **52933**

|  | Min.requis<br>Min.required | Résultat actuel<br>Actual results |
|--|----------------------------|-----------------------------------|
| Tension ultime<br>Ultimate stress (psi)              | 38 000                     | <b>43 043</b>                     |
| Contrainte élastique<br>Yield stress (psi)           | 35 000                     | <b>38 688</b>                     |
| % elongation dans 2"<br>% elongation in 2"           | 8                          | <b>13</b>                         |
| Dureté Rockwell E (hre)<br>Rockwell E Hardness (hre) | 88 @ 100                   | <b>93</b>                         |

Composition chimique typique / Typical chemical composition :

|              | Si          | Fe          | Cu          | Mn          | Mg          | Cr          | Zn       | Ti       |
|--------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|----------|
| <b>6063</b>  | 0,20 - 0,60 | 0,35 Max    | 0,10 Max    | 0,10 Max    | 0,45 - 0,90 | 0,10 Max    | 0,10 Max | 0,10 Max |
| <b>6005</b>  | 0,60 - 0,90 | 0,35 Max    | 0,10 Max    | 0,10 Max    | 0,40 - 0,60 | 0,10 Max    | 0,10 Max | 0,10 Max |
| <b>6005A</b> | 0,68 - 0,72 | 0,15 - 0,27 | 0,08 - 0,12 | 0,20 - 0,24 | 0,48 - 0,52 | 0,03 Max    | 0,05 Max | 0,03 Max |
| <b>6061</b>  | 0,40 - 0,80 | 0,70 Max    | 0,15 - 0,40 | 0,15 Max    | 0,80 - 1,20 | 0,04 - 0,35 | 0,25 Max | 0,15 Max |
| <b>6351</b>  | 0,7 - 1,3   | 0,5 Max     | 0,10 Max    | 0,40 - 0,80 | 0,40 - 0,80 | ---         | 0,20 Max | 0,20 Max |

Nous certifions que le matériel fourni rencontre les exigences chimiques telles qu'annoncées par la norme ASTM B-221-08 excepté pour la section 8.2 (nombre de spécimen) .

We hereby certify that the material supplied meets the chemical properties as published by the ASTM B-221-08 except for section 8.2 (number of specimen) .

Sincèrement vôtre,  
Yours truly,

date : **2012-01-27**

Gilles Pelletier  
Technicien de la qualité  
Quality technician

